

TWO SPECIES OF LUMBRICID EARTHWORM NEWLY RECORDED FROM WESTERN AUSTRALIA

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ABSTRACT

Eisenia rosea (Sav.) and *Octolasion cyaneum* (Sav.) (Oligochaeta: Lumbricidae) are newly recorded from Western Australia. The distribution of *E. rosea* suggests that it may have arrived overland from South Australia. The mode of entry of *O. cyaneum* is unknown.

INTRODUCTION

Prior to European settlement, the only earthworms present in Western Australia belonged to the family Megascolecidae (*sensu* Jamieson 1971). With the trafficking of farm goods and other supplies, and the disposal of ballast at ports, it would not have taken long for lumbricid earthworms to have been accidentally introduced, presumably from Britain. Unfortunately, none of the early naturalists collected earthworms, probably because there were too many novelties to be had with the flora and vertebrate fauna. It was not until the arrival of the Hamburg expedition in 1905 that an attempt to compile an inventory of invertebrates of this State was begun.

Michaelsen (1907) collected in nearly all of the then-settled districts in temperate Western Australia. He recorded five lumbricid earthworm species: *Allolobophora caliginosa*¹ (widespread), *Eiseniella tetraedra* (one locality), *Helodrilus parvus*² (one locality), *H. constrictus*³ (two localities) and *Eisenia foetida*⁴ (one locality).

Jackson (1931) did not add to this list of lumbricid species. I have examined the collection held in the Western Australian Museum, and found no previously unrecorded lumbricid species in Western Australia. In 1977-79, I attempted to add to our meagre knowledge of earthworm distribution in Western Australia. This resulted in an additional two species of lumbricid being recorded from Western Australia.

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¹ I have identified Michaelsen's specimens (deposited in the Western Australian Museum) from selected localities as *Aporrectodea trapezoides* (Dugès, 1828).

² This species is currently referred to as *Bimastos parvus* (Eisen, 1874).

³ This species is currently referred to as *Dendrodrilus rubidus* (Savigny, 1826).

⁴ This species is now correctly referred to as *Eisenia fetida* (Savigny, 1826).

SYSTEMATICS

Family Lumbricidae

Eisenia rosea (Savigny, 1826)

Enterion roseum Savigny, 1826, p. 182

Diagnosis

This is based on a composite of all the material collected. A very detailed description is given by Gates (1973).

Length of preserved specimens: to 75 mm; colour of preserved specimens: anterior pale flesh, rest fawn or fawn all over; male pore: on segment 15, between b and c lines of setae; in clitellate specimens the papillae spread on to segments 14 and 16. Clitellum: white, covering segments 23-, 24- or 25-32. Tuberculum pubertatis: on segments 29-30 or -31. Genital tumescences: may be present on setae a and b between segments 24 and 32. Setae: closely paired.

Distribution

Eisenia rosea has a sparse distribution in the Wheat Belt of Western Australia (Fig. 1). None was found elsewhere during an extensive search of an area of the Wheat Belt bounded by Merredin, Northam, Narrogin, Lake King and Hyden (Abbott and Parker 1980).

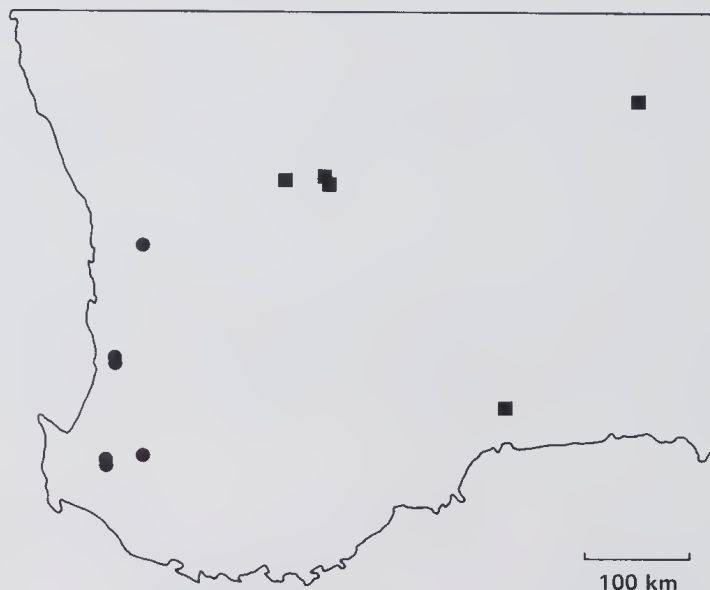


Fig. 1: Map of portion of south-western Australia showing the known distribution of *Eisenia rosea* (■) and *Octolasion cyaneum* (●).

Material Examined

WAM 9-81. Merredin Agricultural Research Station, August 1979. Collected by I. Abbott in clay soil on a creek bank (11 a clitellate specimens) and adjacent wheat crop (1 clitellate, 6 a clitellate). WAM 10-81. Great Eastern Highway, 31 km west of Hines Hill, August 1979. Collected by I. Abbott in a gutter containing clay loam soil, sparsely vegetated with Rye Grass and Double Gee (8 clitellate, 3 a clitellate). WAM 11-81. Forests Department Arboretum, Kalgoorlie, August 1980. Collected by I. Abbott in red clay loam, much overgrown with weeds (1 clitellate, 9 a clitellate). WAM 12-81. Hotel garden, Ravensthorpe, August 1980. Collected by I. Abbott in clay soil with Kikuyu grass (1 a clitellate).

Family Lumbricidae

Octolasion cyaneum (Savigny, 1826)

Enterion cyaneum Savigny, 1826, p. 181

Diagnosis

The following is based on a composite of all the material collected. For a detailed description, see Gates (1974).

Length of preserved specimens: to 105 mm; colour of preserved specimens: anterior segments pink, remainder light grey or fawn/light brown all over. Last few segments in life yellow. Male pore: on segment 15, with papillae only extending slightly to adjacent segments and lying between b and c lines of setae. Clitellum: a distinct saddle, no more ventral than the b setal line, coloured brown, cream or white. It covers segments 28- or 29-34 or -35. Tuberculum pubertatis: white, between b and c setal lines, and covering segments $\frac{1}{2}$ 29- $\frac{1}{2}$ 34, sometimes 30-33 or 30-34. Genital tumescences: variably developed and sometimes absent. On the specimens at hand the arrangement is segment 9 (pair), segment 19 (pair); 18 (pair), 19 (single), 21 (single); 18 (pair), 21 (RHS); 18 (pair), 20 (pair); 17 (RHS), 19 (RHS), 20 (RHS); 17 (RHS), 19 (RHS); 18 (LHS), 20 (RHS); 18 (RHS), 19 (RHS), 21 (LHS); 18 (RHS), 19 (RHS), 20 (LHS); 18 (LHS), 19 (RHS). It is the setae in the a and b lines that are usually modified on tumescences. The a and b setae on segments anterior to 16 are close ($aa < 2ab$), thereafter diverging so that ab (on segments posterior to 19) = $2ab$ (on segments anterior to 15). Generally $cd < bc < ab < aa$.

Distribution

All of the records of *O. cyaneum* are from the high rainfall zone of the south-west of Western Australia (Fig. 1).

Material Examined

WAM 13-81. Ale Farm, about 9 km south of Nannup, March 1979. Collected by I. Abbott in loam in garden and adjacent pasture (9 clitellate). WAM 14-81. Harvey town-site (Herbert Road), September 1979. Collected by E.H. Sedgwick in clayey garden and lawn soil (3 clitellate). WAM 15-81. Adjacent to Blackwood River near Bridgetown, June 1980. Collected by J. Conacher from alluvial soil (6 clitellate, 2 a clitellate). WAM 17-81. Carinyah forest settlement (abandoned), August 1980. Collected by I. Abbott in loamy soil under hardwood plantation (2 clitellate).

Remarks

As *Eisenia rosea* is not known from the Perth metropolitan area (personal observations), its possible point of entry into the State invites comment. This species occurs in South Australia, Victoria and New South Wales. The location of the Western Australian records, all close to major road links with the Eastern States, suggests that *E. rosea* may have been introduced from South Australia. This species probably originally came from Britain. Elsewhere in the Southern Hemisphere, it has been recorded from South Africa (Ljungström 1972), New Zealand (Martin 1977) and Argentina (Ljungström *et al.* 1973).

Carinyah forest settlement was established in 1921 and abandoned in 1970. This is consistent with the idea that *O. cyaneum* was indeed absent from the State when Michaelsen in 1905-06 collected extensively in the high rainfall sector of south-western Australia. This species also has not been recorded from the Perth metropolitan area (personal observations). Elsewhere in Australia, *O. cyaneum* has been recorded from Victoria and New South Wales. I have no useful speculations to offer as to its possible mode of entry into Western Australia. Apart from its occurrence in Australia, other Southern Hemisphere records are New Zealand (Martin 1977) and Argentina (Ljungström *et al.* 1973).

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REFERENCES

- ABBOTT, I. and PARKER, C.A. (1980). The occurrence of earthworms in the wheatbelt of Western Australia in relation to land use and rainfall. *Aust. J. Soil Res.* 18: 343-352.
- GATES, G.E. (1973). Contributions to North American earthworms (Annelida) No. 8. The earthworm genus *Octolasion* in America. *Bull. Tall Timbers Res. Stn.* No. 14: 29-50.
- GATES, G.E. (1974). Contributions on North American earthworms (Annelida) No. 12. Contributions to a revision of the family Lumbricidae. XI. *Eisenia rosea* (Savigny, 1826). *Bull. Tall Timbers Res. Stn.* No. 16: 9-30.
- JACKSON, A. (1931). The Oligochaeta of South-Western Australia. *J. R. Soc. West. Aust.* 17: 71-136.
- JAMIESON, B.G.M. (1971). A review of the megascolecid earthworm genera (Oligochaeta) of Australia. Part I — Reclassification and checklist of the megascolecid genera of the World. *Proc. R. Soc. Qd.* 82: 75-86.

- LJUNGSTRÖM, P.-O. (1972). Introduced earthworms of South Africa. On their taxonomy, distribution, history of introduction and on the extermination of endemic earthworms. *Zool. Jb. Syst. Bd.* 99: 1-81.
- LJUNGSTRÖM, P.-O., de ORELLANA, J.A. and PRIANO, L.J.J. (1973). Influence of some edaphic factors on earthworm distribution in Santa Fe Province, Argentina. *Pedobiologia* 13: 236-247.
- MARTIN, N.A. (1977). Guide to the lumbricid earthworms of New Zealand pastures. *N.Z. J. Exp. Agric.* 5: 301-309.
- MICHAELSEN, W. (1907). Oligochaeta. In 'Die Fauna Südwest-Australiens', 1: 117-232.
- SAVIGNY, J.C. (1826). Analyse d'un mémoire sur les Lombrics par Cuvier. *Mém. Acad. Sci. Inst. France* 5: 176-184.